U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Cicindela laimata algissma*

COMMON NAME: Coral Pink Sand Dunes Tiger Beetle

LEAD REGION: Region 6

INFORMATION CURRENT AS OF: February 22, 2006

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
___ Petitioned - Date petition received: **04/25/1994**
_X_ 90-day positive - FR date: **09/15/1994**
_ 12-month warranted but precluded - FR date:
_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a) Is listing warranted (if yes, see summary of threats below)? YES
b) To date, has publication of a proposal to list been precluded by other higher priority listing actions? YES
c) If the answer to a. and b. is "yes," provide an explanation of why the action is precluded.

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (http://endangered.fws.gov/).

___ Listing priority change
Former LP: ___

New LP: ___

Date when the species first became a Candidate (as currently defined): **11/15/1994**

___ Candidate removal: Former LPN: ___

___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.

___ I – Insufficient information exists on biological vulnerability and threats to support listing.

___ M – Taxon mistakenly included in past notice of review.

___ N – Taxon does not meet the Act's definition of "species."

___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Insect, Cicindelidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Utah

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Kane County, Utah

LAND OWNERSHIP: Over 90 percent of the species population occurs on Utah's Coral Pink Sand Dunes State Park. The remainder of the species population occurs on adjacent Bureau of Land Management managed public land.

LEAD REGION CONTACT: Pat Mehlhop, (303) 236-4215

LEAD FIELD OFFICE CONTACT: Marianne Crawford, (801) 975-3330

BIOLOGICAL INFORMATION

Species Description

The CPSD tiger beetle is a subspecies of the tiger beetle *Cicindela limbata*. It has striking coloration; the large wing cases (known as elytra) are predominantly white and much of the body and legs are covered in white hairs. The upper thorax has a metallic sheen and the eyes are particularly large. Adult beetles are 11-15 mm in size.

Taxonomy

The subspecies was first described as *Cicindela limbata albissima* by Rumpp (1961), who distinguished it from other subspecies of *C. limbata* due to differences in pigmentation and its disjunct location over 600 kilometers (400 miles) from other populations of the species. The three other recognized subspecies of *C. limbata* range from mid-United States to Canada (Hill and Knisley 1991). The range of these four subspecies does not overlap, and they differ primarily in elytral maculation or pigmentation of the wing cases. A recently completed genetic

analysis of the *C. limbata* complex, based on mtDNA work, shows that *C.l. albissima* is genetically distinct from the other subspecies and that it should be considered a full species (Morgan Knisley and Vogler, 2000).

Habitat/Life History

The Coral Pink Sand Dunes (CPSD) tiger beetle appears to have been isolated at a high elevation, and, like other members of the species group, is restricted to a cool, sandy habitat. The species is restricted mostly to a relatively small part of the approximately 13-kilometer (8-mile) long dune field, situated at an elevation of about 1,820 meters (5,970 feet).

Adults range from the swales between the dunes to the upper slopes. They are active predators, attacking and eating prey with their large and powerful mandibles. These beetles are active in the day, preying and scavenging on live and dead insects. At night, the beetles bury into the sand dunes. When mating, the male is able to tightly clasp the female with his mandibles on grooves along her side (Conservation Committee 1997).

Larval CPSD tiger beetles inhabit inter-dunal swales, typically dominated by the leguminous plants *Sophora stenophylla* (silvery sophora) and *Psoralidium lanceolatum* (dune scurfpea), and several grasses including *Sporobolus crptadndrus* (sand dropseed) and *Achnatherum hymenoides* (Indian ricegrass). The beetles also are closely associated with the threatened plant species *Asclepius welshii* (Welsh's milkvetch) which has designated critical habitat in the CPSD. Swales are more productive micro-habitats than the surrounding sand dune slope habitat of the adults. The larvae of this beetle are found in individual burrows within the furrows of the dune system; from here they are able to ambush small invertebrate prey. Within their burrows the larvae may become hosts to the parasitic wasp *Methoca* sp (Knisley and Hill 1994, 1995). They take 2 years to mature to adults (Knisely and Gowan 2005).

Range/Distribution

The CPSD tiger beetle is known to occur only in dunes approximately 7 miles west of Kanab, Kane County, in south-central Utah. The CPSD geologic feature covers approximately 3,500 acres. The northern 1,500 acres is Federal land managed by Kanab Resource Area of the Bureau of Land Management (BLM) and is within the Moquith Mountain Wilderness Study Area (WSA). The southern 2,000 acres of the dunes is within the State of Utah's CPSD State Park. Designated areas to protect beetle habitat from off-road vehicle (ORV) use occur on both State Park and BLM lands. There are 207 acres in CPSD State Park (the core beetle habitat), 370 acres on BLM land that harbors a very small population of tiger beetles, and a corridor joining these two sites that is approximately 137 acres.

At the CPSD State Park the protected area includes a 13-kilometer (8-mile) long dune field at 1,820 meters (6,000 feet) elevation. The occupied habitat is approximately 1,800 by 400 meters (5,900 by 1,000 feet). Over 90 percent of the CPSD tiger beetle's adult and larval populations are restricted to this small site. The second protected area is on BLM-managed lands about 4.8 kilometers (3 miles) north of the tiger beetle's main occupied habitat. This site has three known larval beds and a very small group of adults (Conservation Committee 1997). No other sites of tiger beetle occurrence are known despite thorough searches; researchers are confident that no other populations are present at CPSD (Knisely, pers. comm. 2005).

Population Estimates/Status

Population estimates from 1992 to 1998 were conducted using a mark/recapture method. Since 1998, population estimates of adults have been based on a removal method. Studies were conducted in 2004 to compare the removal method and the mark/recapture method of population estimates. The work involved assessing movement, adult burrowing, and other factors that affect methods of estimation. The results indicated that significant numbers of adults move over a several day period resulting in a population overestimation by a factor of 4.8 when using the mark/recapture method. As a result, the 1992 to 1998 estimates of adult population size at CPSD were significant over estimates (Knisley and Gowan, 2005).

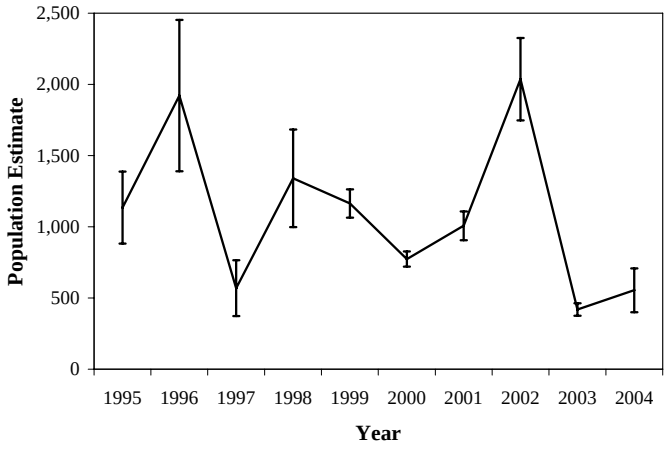

Figure 1. Tiger beetle abundance in the core habitat area of Coral Pinks Sand Dunes, Utah. Vertical bars are 95% confidence intervals (Knisley and Gowan, 2005).

Abundance over time was evaluated based on data collected since 1997 in all swales at CPSD (estimates from 1997 and 1998 probably overestimate the population). There is substantial year-to-year variation, which is typical of many desert arthropods that are greatly affected by climatic factors, especially rainfall (Knisley and Hill 2001). Populations in 2002 were the highest ever recorded, largely due to very large populations in core habitat swales. One year later in 2003, populations were the lowest ever recorded (Knisley and Gowan, 2005). This decline in the population is likely a result of drought (Knisley, 2002). Studies have indicated that rainfall has a positive effect on both oviposition (recruitment) and survivorship, based on availability of prey food, and reduced mortality from desiccation and starvation (Knisley and Hill 2001). Drought conditions since 2001 appear to have resulted in very low recruitment to the population. Although 2005 was a wet year, a positive population response would not be expected for 2 years. Adult abundance in any year is related to the recruitment of new individuals 2 years previous (because of a 2-year life cycle) and the survivorship of the developmental stages of that cohort. The Conservation Agreement and Strategy (CAS) (Conservation Committee 1997) goal of showing self-sustaining or expanding populations has not been achieved (Knisley and Gowan 2003, 2005). Despite increased ORV management and restrictions since 1997, there has not been a corresponding increase in the population.

THREATS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range.
The ORV activity has been attributed to destroying and degrading the beetle's habitat, especially the inter-dunal swales used by the larval population (Knisley and Hill 2001). The inter-dunal swales are the most biologically productive areas in this ecosystem and have the greatest abundance of suitable prey species. Adult beetles are killed by ORVs but more important impacts may be damage to vegetation, reduction in arthropod prey, and disturbance and increased desiccation of the larval microhabitat by ORVs (Knisley 2001). The BLM and State Parks have monitored ORV impacts to the majority of the species' habitat since 1998, enforced ORV restrictions, and designated Conservation Areas to protect beetle habitat by excluding ORV use (Knisley and Hill 1997, 1998, 2001; Knisley 1999, 2000, 2001, 2002).

Approximately 1,650 acres are open to ORV use in the State Park and 1,100 acres in the BLM-managed WSA. The southern portion and bulk of the CPSD tiger beetle population lies within the State Park, where 207 acres are closed to ORV use. An additional 137 acres were restricted for use only as a travel corridor for ORVs. The northern portion on BLM land includes 370 acres protected from ORV use for the tiger beetle.

Although 677 acres out of approximately 3,500 acres has been protected from ORV use, the population has failed to increase. This appears to be primarily due to natural population fluctuations in response to drought (Knisley and Gowan 2003; see discussion under Factor E). Although primary beetle habitat is closed to ORV use, the possibility of the beetles expanding their range into additional habitats is limited because ORV use is destroying or modifying the habitat Knisley and Hill 2001). Therefore, we believe that ORV use remains a factor that threatens the species.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes.
The subspecies may be vulnerable to over-collecting by professional and hobby tiger beetle collectors. Tiger beetles are second only to butterflies among the insects that are desirable objects of natural history collections (Knisley, pers. comm. 1995). The species has been collected, heavily at times, since its discovery and publication of the species description (Rumpp 1961; Knisley and Hill 1994, 1995). Collection of adults, before they mate and lay their eggs, may severely reduce the population's reproductive capacity. Some collection may be legitimate, adding valuable knowledge of biogeography, taxonomy and life history of the species, but this activity needs to be controlled. Restrictions on collecting are enforced by Park and BLM personnel. Quantifying this threat is difficult but at this time it is not considered to be of high magnitude (Knisley, pers. comm. 2005).

C. Disease or predation.
Natural mortality through predation probably accounts for some population loss of both adult and larval CPSD tiger beetles (Knisley and Hill 1995). Wasps of the genus *Methoca* parasitize CPSD tiger beetle larvae (Knisley and Hill 1995). However, we have no evidence that predation is a threat to the subspecies.

D. The Inadequacy of Existing Regulatory Mechanisms.

The CPSD tiger beetle is not directly protected by regulatory mechanisms. No State laws in Utah provide protection to insects. A CAS (Conservation Committee 1997) has been signed and is being implemented, although it is not a regulatory document. The CAS consists of a collaborative effort that details recommended conservation objectives and actions designed to protect and recover the tiger beetle within the CPSD. The BLM, Kanab, Utah Field Office has competed a plan amendment to the Vermilion Management Framework Plan, updating management of the CPSD, Moquith Mountain, and surrounding area. Continued implementation of the CAS for the CPSD Tiger Beetle is included in the plan amendment (BLM 2000a.).

The CPSD geologic feature covers approximately 3,500 acres. Jurisdictionally, the dune ecosystem is bisected. The northern 1,500 acres is Federal land managed by Kanab Resource Area of the BLM and is within the Moquith Mountain WSA. The southern 2,000 acres of the dunes is within the CPSD State Park. The CPSD State Park is categorized as public land with a recreational emphasis. Most of the Moquith Mountain is designated as WSA for watershed protection; wilderness designation protects the beetle primarily in that it restricts ORV use in the wilderness area. The BLM-administered portion of the sand dunes is public land with a rangeland emphasis (BLM 2000a). Both the BLM and the State Park regulations prohibit harassment or collection of wildlife, including plants and animals, or geological or archaeological remains. Public education for both areas includes signage, brochures and interpretive programs.

The BLM amendment to the Vermilion Management Framework Plan includes implementing the conservation actions in the CAS for the CPSD Tiger Beetle, ORV management in the area and coordination of management in the area with the State of Utah, CPSD State Park (65 FR 19921).

Conservation actions defined in the CAS include the formation of two conservation areas to maintain and protect tiger beetle populations in the CPSD geologic feature. The southern portion of CPSD State Park contains the bulk of the tiger beetle population. In this area, 207 acres out of a total of approximately 2,000 acres are closed to ORV use to provide protection for the core beetle habitat. The protected area is defined by signs that are 20 feet apart around the perimeter of the habitat. Protection for the tiger beetle habitat is enforced according to CPSD special closure and restrictions (R615-633-2”1”). The CPSD officers patrol the area daily during times of high recreational use (Justin Cheston-Slater CPSD State Park, pers. comm. 2006). An additional 137 acres has restricted ORV use. This area functions as a travel corridor and provides ORV access between CPSD State Park and BLM land. The remaining 1,656 acres of CPSD State Park provides no protection for the beetle.

A second conservation area managed by BLM is within the northern portion of the CPSD, 370 acres are closed to ORV use to protect a smaller known population of the beetle. Approximately 1,100 acres is available for ORV use in the northern portion as a legitimate activity with the qualifications that ORVs stay on open dunes and keep a 10-foot buffer around vegetation. Enforcement is primarily voluntary compliance (Conservation Committee 1997). Tiger beetles do not occur outside conservation areas. Additional potentially suitable habitat is

not occupied and is designated for ORV use (Hill and Knisley 1991, 1995). Expansion into additional suitable habitats outside the conservation areas is limited by habitat modification and destruction resulting from allowed ORV activity.

An additional complication to managing the protected habitat is movement of the swales due to sand dune movement. To effectively manage conservation areas, boundaries should be reviewed and evaluated periodically.

E. Other Natural or Manmade Factors Affecting Its Continued Existence.
The distribution and abundance of the CPSD tiger beetle are very restricted. This species probably has been in existence several thousand years and has persisted despite flood and drought events that have occurred over time. Drought conditions since 2001 appear to have resulted in very low recruitment to the population. Although 2005 was a wet year, a positive population response would not be expected for 2 years because adult abundance in any year is related to the recruitment of new individuals 2 years previous and the survivorship of the developmental stages of that cohort (Knisley and Gowan 2005). Therefore, the ability of the population to respond positively to the 2005 precipitation is unknown (Knisley, pers. comm. 2006). In times of drought, the overall habitat availability on the dunes is much reduced. Therefore, the existence of additional habitats which could serve as refuge habitat areas becomes crucial for long-term population maintenance (Knisley and Gowan 2005). Essentially, the species requires additional habitat acreage to persist when the availability of suitable habitats is reduced due to climatic conditions (Knisley, pers. comm. 2006). Current ORV use on unprotected areas restricts expansion of the occupied habitat during drought (Knisley 2002). Although naturally occurring flood and drought events are not by themselves a threat to the species, these coupled with additional human-related impacts, such as ORV use, constitute a substantial threat (Knisley, pers. comm. 2006).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

A CAS (Conservation Committee 1997) has been signed and is being implemented. The CAS consists of a collaborative effort that details recommended conservation objectives and actions designed to protect and recover the tiger beetle. The Utah Department of Natural Resources, which oversees State Parks and the Division of Wildlife Resources, the BLM, the Service, and the County Commissioner are signatories. A CAS Technical Committee was established to coordinate activities involving management of the tiger beetle. The committee meets on an informal basis to evaluate management actions and needs. Specifics of the CAS are described in the previous section.

The tiger beetle continues to be monitored on a yearly basis; this has been ongoing since 1992. Research continues on tiger beetle life history and biology as a part of the annual monitoring.

The BLM and State Park personnel have promoted public awareness and conservation of the tiger beetle. Visitors to the sand dunes and other interested persons have access to two brochures prepared by State of Utah's Division of Park and Recreation on the tiger beetle. The State Park has posted tiger beetle interpretation signs at various locations at the dunes.

SUMMARY OF THREATS

The CPSD tiger beetle is known to occur only at CPSD, about 7 miles west of Kanab, Kane County, in south-central Utah. The CPSD encompasses 3,500 acres but the beetle is restricted to a very small portion. An approximate 13-kilometer (8-mile) long dune field was established as the CPSD State Park in 1963 to serve as access to the dunes for recreation, and to protect the dune resources. The ORV recreational activity destroyed and degraded much of the beetle's habitat, especially the most productive inter-dunal swales. Conservation areas were established in 1997 and the recreational ORV use in protected beetle habitat areas is managed by both the Utah Department of Parks and Recreation and the BLM, but population expansion into additional suitable habitats outside the conservation areas is restricted by habitat modification and destruction resulting from ORV activity. Drought is now considered to be effecting tiger beetle populations. The area has been in a drought from 2001 to 2005. The tiger beetles are limited to the amount of habitat available in the conservation areas, which is even more limited during drought years due to reduced soil moisture and productivity in swales. Although naturally occurring drought events are not by themselves a threat to the species, these coupled with additional human related impacts constitute a cumulative and substantial threat to the existence of the species.

LISTING PRIORITY

THREAT			
MAGNITUDE	IMMEDIACY	TAXONOMY	PRIORITY
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	**9***
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

RATIONALE FOR LISTING PRIORITY NUMBER

MAGNITUDE: Moderate.
This species is restricted to one small population threatened by recreational ORV use in its limited range. That threat is currently managed to some degree by restricted ORV use in known occupied habitats on Utah Parks and Recreation and BLM lands. There is no ORV restriction in immediately adjacent habitats. The species population is still at low levels and does not appear to be improving despite efforts prescribed in the CAS, primarily consisting of limiting ORV use, public awareness and additional research.

Tiger beetle population levels have been shown to decline with drought conditions. Although naturally occurring drought events should not by themselves be a threat, these coupled with additional human related impacts compounds the effect. Population expansion into additional suitable habitats outside the conservation areas is limited by habitat modification and destruction resulting from ORV activity. Tiger beetle populations may be threatened if they are unable to persist in refuge habitats during unfavorable environmental conditions (Knisley, pers. comm. 2006).

The ongoing threats of ORV activity, in tandem with drought remains a factor that continues to result in declining tiger beetle population levels. However, we rank the magnitude as moderate because ongoing monitoring and research should assist with continued cooperation and implementation of necessary conservation measures in accordance with the interagency CAS. These efforts should eventually lead to a better understanding of tiger beetle habitat use in the CPSD and better long-term management of ORV use.

IMMINENCE: Imminent.
The threat to the species is imminent because it is a narrow endemic and is intrinsically vulnerable to climatic factors such as drought and flood. The ORV use continues at CPSD, particularly in areas immediately adjacent to known occupied habitats. The effects of this activity are still being studied and monitored.

YES Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? NO. The CAS and implementing Conservation Committee continue to provide effective management direction for the CPSD tiger beetle.

DESCRIPTION OF MONITORING

The tiger beetle continues to be monitored on a yearly basis by Dr. Barry Knisley of Randolph-Macon College. Dr. Knisley's studies have documented changes in the tiger beetle populations since 1992. Before 1999 methods of estimating population size by the mark-recapture method resulted in an over-estimation of population size, especially when compared to the removal method used since then (Knisley and Gowan, 2005). These concerns have been addressed and apparently corrected. The CAS goal of showing self-sustaining or expanding populations has not yet been achieved and overestimates of adult numbers from 1992 to 1998 influenced an unrealistically high target of 2,000 adults which needs to be reevaluated.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment--Utah.

Indicate which State(s) did not provide any information or comments—Not applicable..

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: Sharon Rose 11/4/2005

Acting Regional Director, Fish and Wildlife Service Date

Concur: August 23, 2006

Director, Fish and Wildlife Service Date

Do not concur:

Director, Fish and Wildlife Service Date